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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/530,122	04/20/2000	HIROKI NAKAHARA	9319S-000126	2816

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EXAMINER	
QI, ZHI QIANG	
ART UNIT	PAPER NUMBER
2871	

DATE MAILED: 07/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/530,122	NAKAHARA ET AL.	
	Examiner	Art Unit	
	Mike Qi	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 May 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *8* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1,10, 17, 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant admitted prior art (AAPA) in view of US 6,507,381 (Katsuya et al).

Claims 1, 10, 17, 23 and 24, AAPA discloses (page 1, line 10 – page 4, line 21; Figs.11-12) that a liquid crystal panel comprising:

(concerning claims 1 and 23)

- a pair of substrates (1, 2) bonded to each other by a sealant (3) with a predetermined gap therebetween;
- a liquid crystal (40) enclosed in the region delimited by the sealant (3) between the pair of substrates (1,2);
- electrodes (6A,7A) formed on each of the pair of substrates (1,2) for controlling the alignment state of the liquid crystal;
- an alignment layer (13, 23) formed on the electrodes.

(concerning claims 10 and 24)

- a first substrate (1);
- first electrodes (6A) formed on the first substrate (1);

- a first alignment layer(13) formed over the first electrodes (6A);
- a second substrate (2);
- a second electrodes (7A) formed on the second substrate (2);
- a second alignment layer (23) formed over the second electrodes (7A);
- a sealant (3) coupled between the first and the second substrates so as to form a gap therebetween.

(concerning claim 17)

- providing a first substrate (1);
- defining a plurality of smaller substrate forming region (1A) on the first substrate (1), and the plurality of smaller substrate forming region (1A) being divided by a plurality of projected cutting lines (L1,L2);
- depositing electrodes (6A) on the first substrate (1) within each of the smaller substrate forming regions (1A);
- defining a sealant deposit region (3) along each of the smaller substrate forming regions (1A);
- depositing a thin film for forming an alignment layer (13) on the first substrate (1).

AAPA does not expressly disclose that terminals formed on each of the pair of substrates for conducting between the substrates (or between first and second electrodes), and each of the alignment layers is formed to cross (or to cover) the sealant forming region that is other than the region for conducting between the substrate (or the region having terminals).

However, the function of the electrodes is to apply electrical signals such as gate scanning signal, video data signal or power supply signal, therefore, the electrodes must have terminals for applying the signals, such that the terminals of the electrodes must also be formed on each of the pair of substrates (1,2) for conducting between the substrates (or between first and second electrodes), and that is a conventional in the art.

Katsuya discloses (col.4, line 59 – col.8, line 3; Fig.2) that a structure of a liquid crystal panel (10) in which the alignment films (12a,12b) to cross (or to cover) the sealer forming region (15), or in other words, the alignment layer (12a, 12b) is formed to cover or to cross the sealant forming region (15) that is other than the region for conducting between the substrates or the region having electrode terminals. Therefore, the image display region (having electrode terminals) would be enlarged.

Katsuya indicates (col.7, lines 59 – 63) that such construction of the liquid crystal panel would make it possible to miniaturize the liquid crystal panel itself, such that the image display region would be utilized more efficiently, and that would comparatively enlarge the image display region.

AAPA also indicates (page 3, line 17 – page 4, line 4; Fig.11) that in the conventional liquid crystal panel, since there is a space (S) between the sealant (3) and the alignment layer (13 or 23), so that a low twist domain occurs in the liquid crystal layer (40) corresponding to the space (S), and that would degrades the display quality, such that the region corresponding to the space (S) cannot be used as the image display region, thus the effective image display region is reduced.

Therefore, according to the combination of AAPA and Katsuya, those skilled in the are would consequently develop the modification to reduce the space between the sealant forming region and the alignment film as close as possible in order to reduce the low twist domain occurrence, such as to make the alignment layer to cover or to cross the sealant forming region for enlarging the image display region.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange the alignment layers to cover or to cross the sealant forming region as claimed in claims 1, 10, 17, 23 and 24 for miniaturizing the liquid crystal panel and enlarging the image display region.

3. Claims 2-9, 11-16, 18-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA and Katsuya as applied to claims 1, 10, 17, 23 and 24 above, and further in view of US 5,150,239 (Watanabe et al).

Claim 2, Watanabe discloses (col.1, lines 14-35) that a one-pack type or single-liquid type epoxy resin adhesive (such as one-pack type thermosetting epoxy adhesive) has been conventionally used as an adhesive for constituting a sealant for liquid crystal cells, because of its high strength and excellent heat resistance, chemical resistance and moisture resistance, etc. Therefore, using one-part thermosetting epoxy as a sealant is a conventional, and would have been at least obvious.

Claims 3-4, the alignment layers is formed up to the region overlapping the sealant forming regions as the explanation of Katsuya above, that would have been at least obvious. The rectangular substrates have four sides, so that the sealant must be deposited corresponding to at least three sides of the substrates (one side would be

used for the input-output terminals and terminals for conducting between substrates, i.e., the electrical wirings.) Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange the sealant corresponding to four sides of the substrates or at least three sides excluding one side for the electrical wirings as claimed in claims 3-4 for achieving good sealing between the substrates.

Claim 5, AAPA discloses (Fig.11) a transparent insulating film (22) covering the electrodes (7A) and overlapping the alignment layer (23).

Claims 6-9, AAPA discloses (Figs.11-12) that the electrodes (7A) are formed on the surface of a large substrate (2) for forming a plurality of pair of substrates (1A,2A) along cutting projection lines (L1,L2). Although AAPA does not expressly disclose the alignment layers are formed overlapping the sealant including the cutting projection lines, but Katsuya discloses (Fig.2) that the alignment layers are formed to cross the sealant forming region other than the region for conducting between the substrate, and overlapping the edge portion of the sealant (the cutting projection lines), and alignment films would be formed in strips along the cutting projection line, as the explanation of Katsuya above, and that would have been at least obvious.

Claims 11-14, Katsuya discloses (Fig.2) that the first alignment layer (12a) is interposed between the sealant (15) and the first substrate (11a); the second alignment layer (12b) is interposed between the sealant (15) and the second substrate (11b); the first alignment layer (12a) extends to a perimeter of the first substrate (11a); and the second alignment layer (12b) extends to a perimeter of the second substrate (11b). As the explanation of the Katsuya above, such structure of liquid crystal panel would

miniaturize the liquid crystal panel, and the display area would be utilized efficiently, of cause, it would enlarge the image display region.

Therefore, it would have been obvious to those skilled at the time the invention was made to arrange the alignment layers to cross or to cover the sealant forming region as claimed in claims 11-14 for miniaturizing the liquid crystal panel and efficiently utilizing the display area.

Claim 15, AAPA discloses (Fig.12) that the rectangular substrates have four sides, and one side would be used for the input-output terminals, i.e., the electrical wirings.

Claim 16, AAPA discloses (Fig.11) that a first transparent insulating film (12) interposed between the first alignment layer (13) and the first substrate (1) over the first electrodes (6A); a second transparent insulating film (22) interposed between the second alignment layer (23) and the second substrate (2) over the second electrode (7A); and the Fig.11B shows the first and second transparent insulation films (12,22) are complementing a configuration of the first and second alignment layers (13,23).

Claims 18-19, Katsuya discloses (Fig.2) that a structure of a liquid crystal panel in which the alignment film (12b) is deposited to overlap the sealing deposit region (15) and extends to the edge portion of the panel, so that the alignment film (12b) is also overlap the plurality of projected cutting lines. As the explanation of the Katsuya above, such structure of liquid crystal panel would miniaturize the liquid crystal panel, and the display area would be utilized efficiently, of cause, it would enlarge the display area.

Therefore, it would have been obvious to those skilled at the time the invention was made to arrange the alignment layers overlapping the sealing deposit region as claimed in claims 18-19 for miniaturizing the liquid crystal panel and efficiently utilizing the display area.

Claim 20, AAPA discloses (Fig.11-12) that to bond the substrates must deposit the sealant on the sealant deposit region, and it is a conventional in the art to deposit the sealant on each smaller substrate, since that would achieve a stronger bonding.

Claim 21, AAPA discloses (Figs.11-12) that providing a second substrate (2); defining a plurality of second smaller substrate (2A) being divided by a plurality of second projected cutting lines (L1,L2); depositing second electrode (7A), and the electrodes must have terminals for supplying electrical signals; defining a second sealant deposit region along each second smaller substrate (2A); depositing a second alignment layer (23) on the second substrate (2); bonding the substrates; cutting the first and second substrate along the projecting cutting lines (L1, L2). Although Applicant admitted prior art does not expressly disclose the alignment layer crossing the sealant deposit region on a side of each of the second smaller substrate forming region other than the side having terminals, but Katsuya discloses (col.4, line 59 – col.8, line 3; Fig.2) that a structure of a liquid crystal panel (10) in which the alignment films (12a,12b) crossing or covering the sealant deposit region. The rectangular substrates have four sides, so that the sealant must be formed around at least three sides. Such structure would miniaturize the liquid crystal panel, and the display area would be utilized efficiently, of cause, it would enlarge the display area.

Therefore, it would have been obvious to those skilled at the time the invention was made to arrange the alignment layers engaging the sealant forming region as claimed in claim 21 for miniaturizing the liquid crystal panel and efficiently utilizing the display area.

Claim 22, AAPA indicates (page 3, line 17 – page 4, line 4; Fig.11) that in the conventional liquid crystal panel, since there is a space (S) between the sealant (3) and the alignment layer (13 or 23), so that a low twist domain occurs in the liquid crystal layer (40) corresponding to the space (S), and that would degrades the display quality, such that the region corresponding to the space (S) cannot be used as the image display region, thus the effective image display region is reduced.

Therefore, those skilled in the are would be consequently develop the modification to reduce the space between the sealant forming region and the alignment film as close as possible (such as the alignment layer partially overlaps the sealant forming region other than the region for conducting between the substrates) in order to reduce the low twist domain occurrence, such as to make the alignment layer to cover or to cross the sealant forming region or the alignment layer partially overlaps the sealant forming region other than the region for conducting between the substrates for enlarging the image display region.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange the alignment layers partially overlaps the sealant forming region as claimed in claim 21 for miniaturizing the liquid crystal panel and enlarging the image display region.

Response to Arguments

4. Applicant's arguments filed on May 12,2003 have been fully considered but they are not persuasive.

Applicant's **only** arguments are as follows:

1) The reference Katsuya does not teach motivation to utilize such configuration wherein the terminals formed on each of the pair of substrates for conducting between the substrate and the alignment layer to be formed so as to cross the sealant forming region other than the region for conducting between the substrates.

Examiner's responses to applicant's **only** argument s are as follows:

1) Because the function of the electrodes is to apply electrical signals such as gate scanning signal, video data signal or power supply signal, therefore, the electrodes must have terminals for applying the signals, such that the terminals of the electrodes must also be formed on each of the pair of substrates (1,2) for conducting between the electrodes and the electrode formed on the pair of the substrates, and that is a conventional in the art.

Katsuya discloses (col.4, line 59 – col.8, line 3; Fig.2) that a structure of a liquid crystal panel (10) in which the alignment films (12a,12b) to cross (or to cover) the sealer forming region (15), or in other words, the alignment layer (12a, 12b) is formed to cover or to cross the sealant forming region (15) that is other than the region for conducting between the substrates or the region having electrode terminals. Therefore, the image display region (having electrode terminals) would be enlarged.

Katsuya indicates (col.7, lines 59 – 63) that such construction of the liquid crystal panel would make it possible to miniaturize the liquid crystal panel itself, such that the image display region would be utilized more efficiently, and that would comparatively enlarge the image display region. AAPA also indicates (page 3, line 17 – page 4, line 4; Fig.11) that in the conventional liquid crystal panel, since there is a space (S) between the sealant (3) and the alignment layer (13 or 23), so that a low twist domain occurs in the liquid crystal layer (40) corresponding to the space (S), and that would degrades the display quality, such that the region corresponding to the space (S) cannot be used as the image display region, thus the effective image display region is reduced.

Therefore, those skilled in the art would be motivated to develop such configuration wherein to reduce the space between the sealant forming region and the alignment film as close as possible in order to reduce the low twist domain occurrence, i.e., the alignment layer to cover or to cross the sealant forming region for enlarging the image display region.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Such as the references US 4,391,491, US 5,396,355, etc.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mike Qi whose telephone number is (703) 308-6213. The examiner can normally be reached on Monday to Thursday 8:00am-5:00pm.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

ROBERT H. KIM
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

Mike Qi
May 30, 2003